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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,588	06/29/2001	Takashi Kumamoto	219.40240X00	5620

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EXAMINER

CHAMBLISS, ALONZO

ART UNIT PAPER NUMBER

2827

DATE MAILED: 01/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/893,588

Applicant(s)

KUMAMOTO, TAKASHI

Examiner

Alonzo Chambliss

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. The new declaration filed on 10/22/01 has been fully considered and made of record in Paper No. 3.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 1200 in Fig. 12. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The abstract of the disclosure is objected to because the protection tape, which is an essential element in applicant's invention, is not mention in the abstract. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 6, 17, and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. In claims 6, 17, and 29, the word "predetermined" is vague and indefinite.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-34, insofar as definite, are rejected under 35 U.S.C. 103(a) as being unpatentable over Saitoh (U.S. 6,060,373) in view of Grigg et al. (U.S. 2002/0068453).

With respect to Claims 1, 13, and 23, Saitoh discloses a back-grind/mounting arrangement comprising bumped die 11 with a planarizing support layer 13 provided on a bumped surface of the bumped die 11. The support layer 13 comprises a pre-back-grind underfill layer 18 both to provide substantially planar back-grind wafer support during any back grind process (see col. 1 lines 5-19, col. 2 lines 50-67, and col. 3 lines 1-30; Figs. 1a-1j, 2a-2d, and 2n-2p)). Saitoh does not explicitly disclose using the pre-back grind underfill layer to provide underfill material during any mounting/under-fill process. However, Grigg discloses a pre-back grind underfill layer 30 to provide underfill material during any mounting/under-fill process. The pre-back grind underfill layer is utilized in the back-grinding process of the wafer (see page 7, paragraph 63-65;

Figs. 5 and 6). Therefore, it would have been obvious to incorporate the underfill layer with the device of Saitoh, since the pre-back grind underfill layer would aid in the back-grinding process of the wafer and to absorb the inherent physical and thermal stress resulting from differing expansion rates of an integrated circuit semiconductor die and its interconnecting substrate as taught by Grigg.

With respect to Claims 2, 12, and 24, Grigg discloses the under-fill layer 30 covering at least a substantial majority of bump-bodies of bump 18 on the bumped surface, while leaving a remainder portion of the bump-bodies exposed (see Fig. 5).

With respect to Claims 3, 13, and 25, Grigg disclose the support layer comprising an adhesive protection tape including a flexible conforming layer applied to the under-fill layer 30. The conforming layer covers the reminder portion of the bump-bodies not covered by the under-fill layer 30 of bumps 18 on the bumped surface to further improve a planarity of the support layer (see page 8, paragraph 65).

With respect to Claims 4, 15, and 27, Saitoh discloses the under-fill layer 18 covering an entirety of bump-bodies of bumps 17 on the bumped surface (see Fig. 1f).

With respect to Claim 5, 16, and 28, Saitoh discloses the support layer 13 comprises an adhesive protection tape applied to the under-fill layer 18 (see col. 3 lines 1-11; Figs. 1h and 2n).

With respect to Claims 6, 17, and 29, Saitoh discloses the under-fill layer 18 being a thickness beyond a height thickness of the bump-bodies 17 when incorporate with the under-fill layer 30 taught by Grigg, would provide additional under-fill material to under-fill structures other than the bumps 18 during any mounting/under-fill process.

With respect to Claims 7-10, 18-20, 30-32, Grigg discloses the under-fill layer 30 comprise a thermoplastic polymer material (see page 6, paragraph 57).

With respect to Claims 10, 21, and 33, Grigg discloses the under-fill layer 30 comprising an opaque material to provide at least one of UV light and radiation protection to a surface of the bumped-die, since a UV sensitive tape is used in the process of thinning the wafer allowing for a loss in the adhesive properties of the tape to occur during the curing by UV radiation (see page 8, paragraph 65).

With respect to Claims 14 and 26, Grigg discloses providing a secondary under-fill layer to under-fill 30 to structures other than the bumps as encountered during any mounting process (see page 9, paragraph 76).

With respect to Claims 22 and 34, Grigg discloses the arrangement, which is a flip-chip back-grind/mounting arrangement (see page 8, paragraphs 70-72; Fig. 6).

The prior art made of record and not relied upon is cited primarily to show the product and device of the instant invention.

Conclusion

9. Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956.

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A handwritten signature in cursive script, appearing to read "Alonzo Chambliss".

Alonzo Chambliss
Examiner
Art Unit 2827